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**Identification cards — Contactless  
integrated circuit(s) cards — Proximity  
cards —**

**Part 3:  
Initialization and anticollision —**

**AMENDMENT 1: Bit rates of *fc/64*, *fc/32* and  
*fc/16***

ISO/IEC 14443-3:2001/Amd 1:2005

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Cartes de proximité —**

*Partie 3: Initialisation et anticollision*

*AMENDEMENT 1: Débits binaires de *fc/64*, *fc/32* et *fc/16**

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The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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Amendment 1 to ISO/IEC 14443-3:2001 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification*.

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# Identification cards — Contactless integrated circuit(s) cards — Proximity cards —

## Part 3: Initialization and anticollision

### AMENDMENT 1: Bit rates of $fc/64$ , $fc/32$ and $fc/16$

Page 2, term number 3.5

Replace the existing definition with the following:

"elementary time unit

**etu**

time unit calculated by the following formula:

$$1 \text{ etu} = 128 / (D \times fc)$$

where

$$D \in \{1, 2, 4, 8\}$$

$fc$  is the carrier frequency as defined in ISO/IEC 14443-2.

The initial value of the divisor D is 1, giving the initial etu as follows:  $1 \text{ etu} = 128 / fc$ .

Page 3, Clause 4

Add the following new abbreviations:

"D Divisor

TR2 Frame delay Time PICC to PCD, Type B"

Page 5, Clause 5

Replace the existing Clause 5 title with the following:

"

**5 Alternating between Type A and Type B commands,**

**5.1 Polling**

"

Add the following at the end of the new subclause 5.1:

"EXAMPLE 3 When a PICC Type A is exposed to field activation it shall be able to accept a REQA within 5 ms of unmodulated operating field.

EXAMPLE 4 When a PICC Type B is exposed to field activation it shall be able to accept a REQB within 5 ms of unmodulated operating field.

5.2 Influence of Type A commands on PICC Type B operation

A PICC Type B should either go to IDLE state (be able to accept a REQB) or be able to continue a transaction in progress after receiving any Type A command.

5.3 Influence of Type B commands on PICC Type A operation

A PICC Type A should either go to IDLE state (be able to accept a REQA) or be able to continue a transaction in progress after receiving any Type B command.

5.4 Transition to Power OFF state

The PICC shall be in the Power OFF state no later than 5 ms after the operating field is switched off."

Page 5, Clause 6

Insert the following new subclause before the existing subclause 6.1 and renumber all subsequent subclauses.

6.1 Bit rates

Communication between PCD and PICC can be achieved with four different bit rates (see Table Amd.1-1).

Bit rates of fc/64, fc/32 and fc/16 are optional and may be independently supported by PCD and PICC.

Table Amd.1-1 — Bit rates

Table with 3 columns: Divisor D, etu, Bit rate. Rows include values for D=1, 2, 4, 8 and corresponding etu and bit rate calculations.

NOTE The initial bit rate is fc/128. This applies for the whole initialization and anticollision sequence."

Page 6, subclause 6.1.2 (renumbered to 6.2.2)

Replace Figure 1 with the following:

"

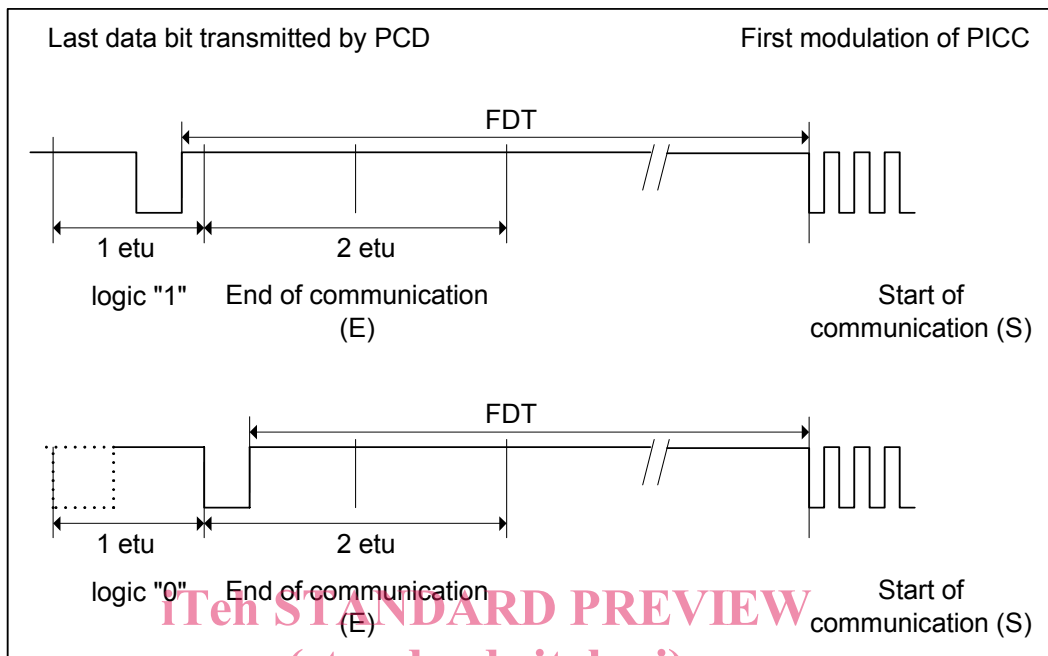


Figure 1 — Frame delay time PCD to PICC"

Replace Table 1 and the last two sentences of subclause 6.1.2 (renumbered to 6.2.2) with the following:

"Table 1 — Frame delay time PCD to PICC

Command type		n (integer value)	FDT	
			last bit = (1)b	last bit = (0)b
REQA Command WUPA Command ANTICOLLISION Command SELECT Command		9	$(n*128+84)/fc$ [ = 1236/fc ]	$(n*128+20)/fc$ [ = 1172/fc ]
<b>All other commands at bit rates</b>				
PCD to PICC	PICC to PCD			
$fc/128$	$fc/128$	$\geq 9$	$(n*128+84)/fc$	$(n*128+20)/fc$
$fc/64$		$\geq 8$	$(n*128+148)/fc$	$(n*128+116)/fc$
$fc/32$		$\geq 8$	$(n*128+116)/fc$	$(n*128+100)/fc$
$fc/16$		$\geq 8$	$(n*128+100)/fc$	$(n*128+92)/fc$
$fc/128$ or $fc/64$ or $fc/32$ or $fc/16$	$fc/64$ or $fc/32$ or $fc/16$	Not applicable	$\geq 1116/fc$	$\geq 1116/fc$
All PICCs in the field shall respond in a synchronous way to the commands REQA, WUPA, ANTICOLLISION and SELECT. This is needed for anticollision.				

The FDT tolerance is in the range of -0 to +0,4  $\mu$ s (derived from t4 defined in ISO/IEC 14443-2:2001, Figure 3)."

Page 7, subclause 6.1.5.2 (renumbered to 6.2.5.2)

Add the following text and figure after Figure 3:

"

As an exception the last parity bit of a PICC standard frame shall be inverted if this frame is transmitted with bit rate of  $fc/64$ ,  $fc/32$  or  $fc/16$  (see Figure Amd.1-1).

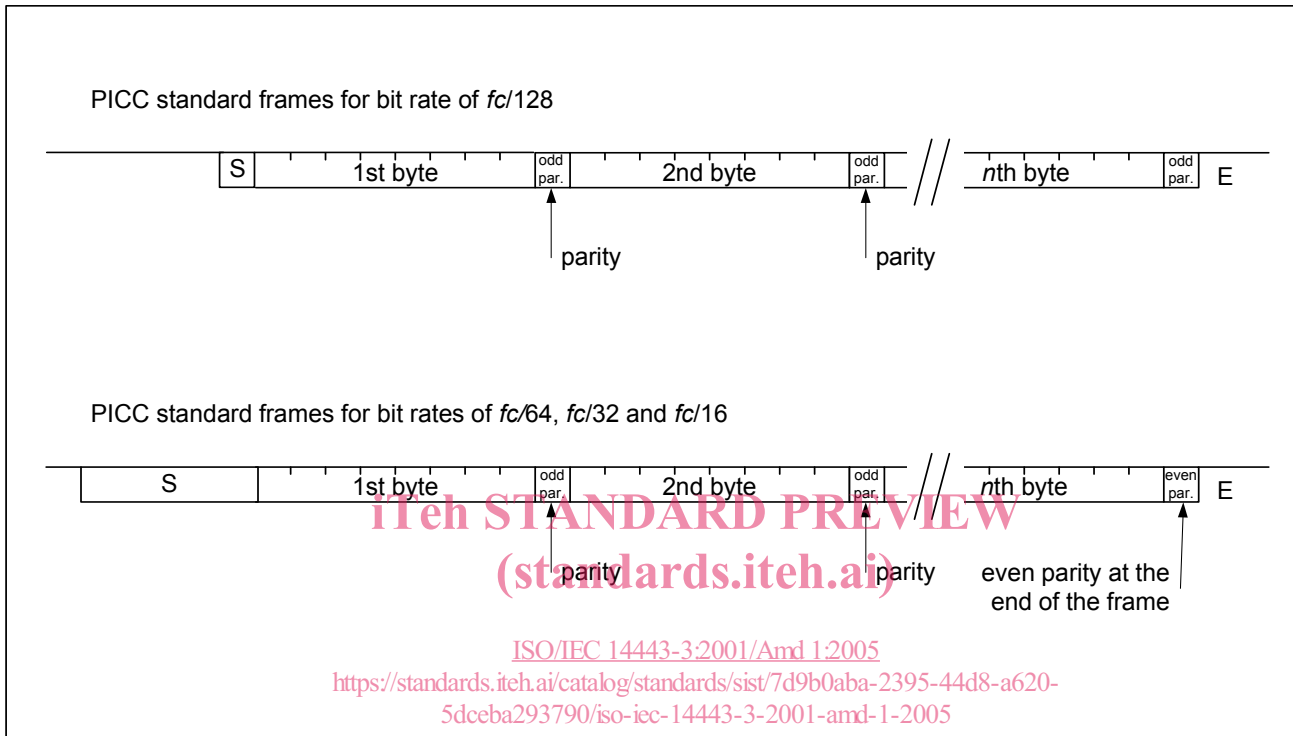


Figure Amd.1-1 — PICC standard frames"

Page 10, subclause 6.2 (renumbered to 6.3)

Add the following text between the lines beginning DESELECT and Error:

"RATS RATS Command defined in ISO/IEC 14443-4"

Page 10, Figure 6

Replace the text "ISO/IEC 14443-4" in the state bubble with "PROTOCOL state" and replace the text "Enter ISO/IEC 14443-4" between the arrows with "RATS".



Page 14, Clause 6.4.1 (renumbered to 6.5.1)

Replace Figure 8 with the following figure:

"

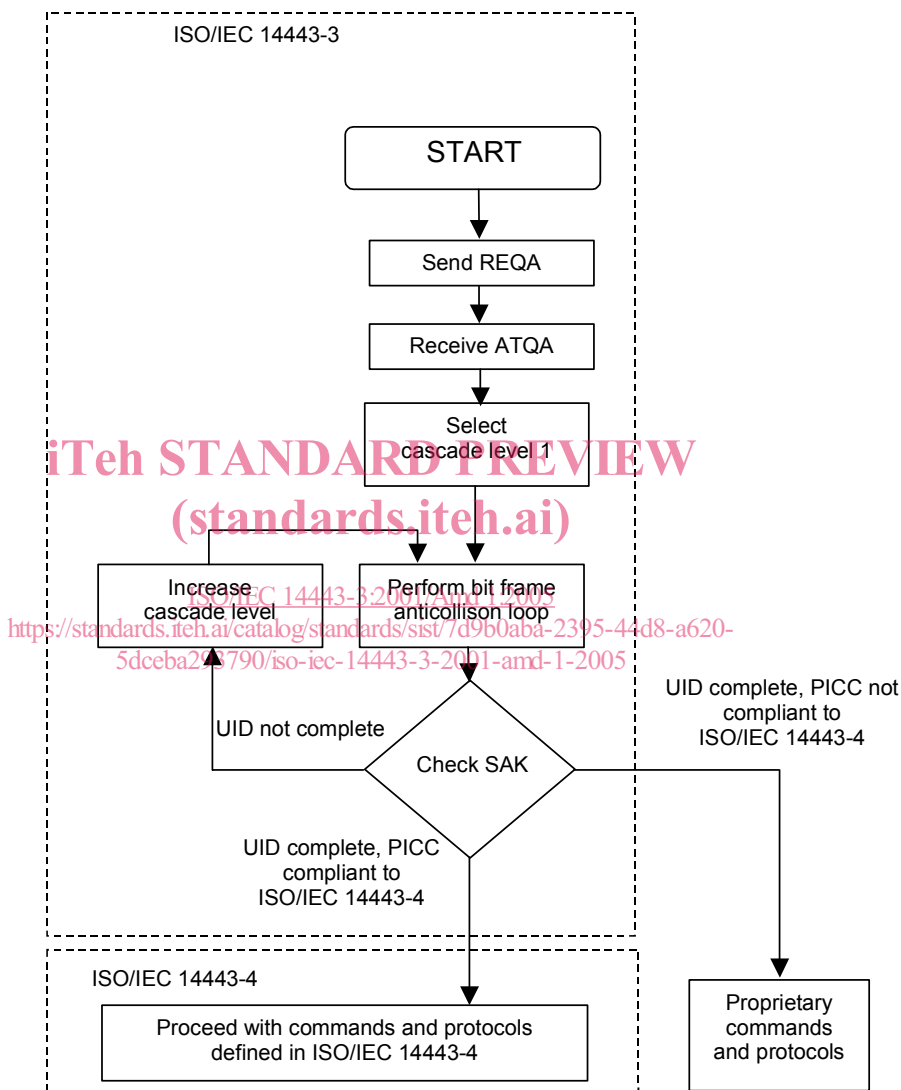


Figure 8 — Initialization and anticollision flowchart for PCD"

Page 14, subclause 6.4.1 (renumbered 6.5.1)

Add the following note and text after modified Figure 8:

"NOTE PICCs may use ATQA bit combinations of b9 to b12 for indication of proprietary methods.

PICCs that do not support the mandatory bit frame anticollision are not compliant with this standard."